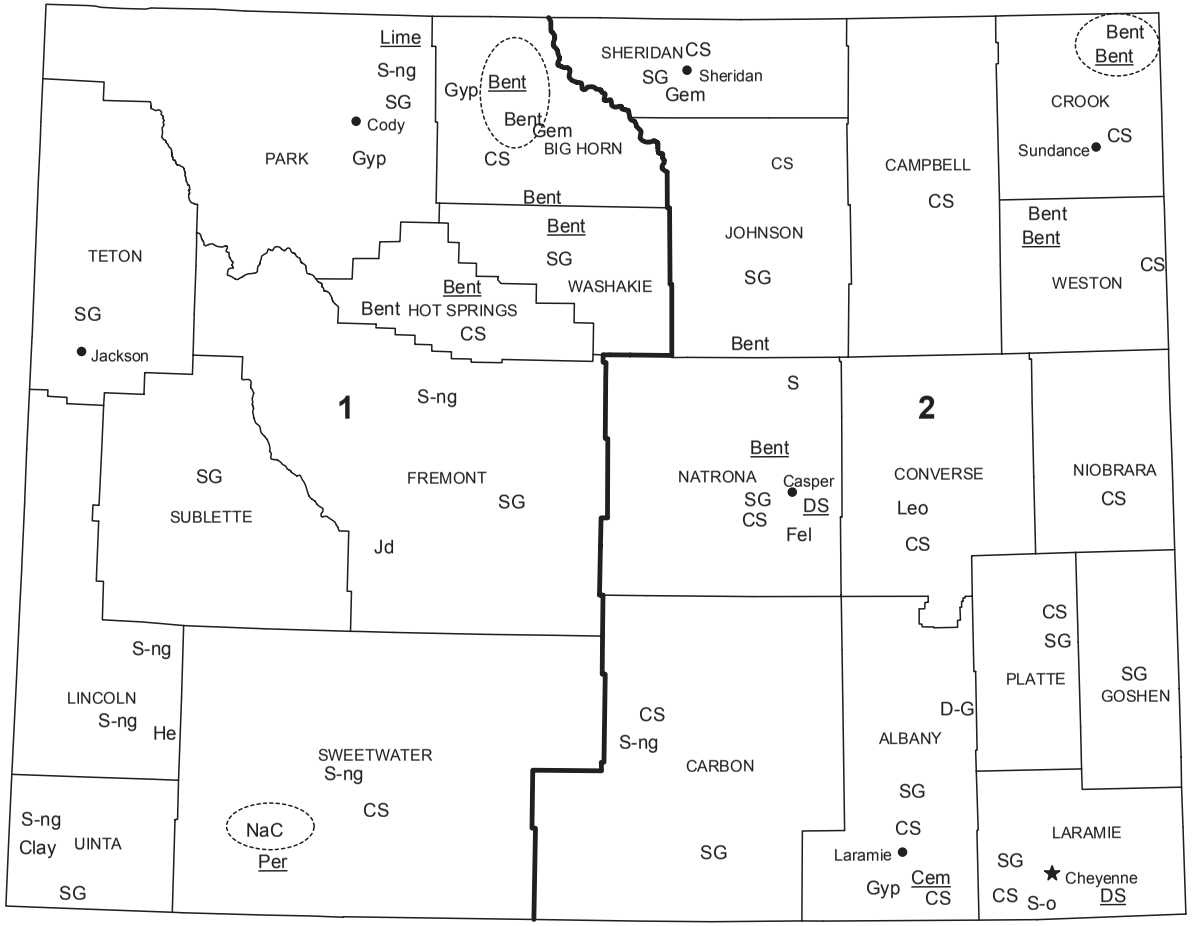
WYOMING



MINERAL SYMBOLS (Major producing areas)

Bent	Bentonite
Bent	Bentonite plant
Cem	Cement plant
Clay	Common clay
CS	Crushed stone
D-G	Dimension granite
DS	Dimension stone plant
Fel	Feldspar
Gem	Gemstones
Gyp	Gypsum
He	Helium
Jd	Jade
Leo	Leonardite
Lime	Lime plant
NaC	Sodium carbonate
Per	Perlite plant
S	Sulfur
S-ng	Sulfur (natural gas)
S-o	Sulfur (oil)
SG	Construction sand and gravel
	Concentration of mineral operations

LEGEND

- County boundary
- ★ Capital
- • City
- 1 — Crushed stone/sand and gravel districts

0 100 Kilometers

Source: Wyoming State Geological Survey/U.S. Geological Survey (2003)

THE MINERAL INDUSTRY OF WYOMING

This chapter has been prepared under a Memorandum of Understanding between the U.S. Geological Survey and the Wyoming State Geological Survey for collecting information on all nonfuel minerals.

In 2003, the estimated value[1] of nonfuel mineral production for Wyoming was $1.01 billion, based upon preliminary U.S. Geological Survey (USGS) data. This value was unchanged from the estimated values for 2002[2] and 2001, respectively. For the second consecutive year, the State ranked 13th among the 50 States in total nonfuel mineral production value and accounted for more than 2.5% of the U.S. total.

Soda ash was Wyoming's leading nonfuel mineral, by value, followed by bentonite, Grade-A helium, and portland cement. Together, the four accounted for nearly 93% of the State's total raw nonfuel mineral production value. In 2003, increases in the values of Grade-A helium and gypsum were balanced by decreases (in descending order of change) in the values of soda ash, bentonite, portland cement, construction sand and gravel, and crushed stone, which resulted in no significant change in the total nonfuel raw mineral production value for the year. In 2002, increases in the values of Grade-A helium and crushed stone were balanced out mostly by decreases in the values of bentonite, construction sand and gravel, portland cement, and soda ash that resulted in no overall change for the year (table 1).

Based upon USGS estimates of the quantities of minerals produced in the 50 States during 2003, Wyoming again ranked 1st in soda ash and bentonite production and 2d in Grade-A helium production; the State's ranking rose to 9th from 11th in the production of gypsum. Soda ash (sodium carbonate), which is produced mainly from trona ore, is an inorganic chemical that is used extensively in the manufacture of glass, paper, soap and detergents, and textiles, and, in the form of sodium bicarbonate, in food products. The United States is the world's second largest producer of soda ash. Wyoming was one of only three soda-ash-producing States and is home to the world's largest known natural deposit of trona. California and Colorado produce significantly smaller quantities of natural soda ash.

The Wyoming State Geological Survey (WSGS) provided the following narrative information.[3] Production data in the text that follows are those reported by the WSGS and are based on the agency's own surveys and estimates. They may differ from some production figures reported to the USGS.

Exploration and Development Activities

Industrial Minerals

Diamond and Gemstones.—As of 2003, at least 22 in situ diamond deposits had been identified in Wyoming, which hosts the two largest kimberlite districts in the United States (the Iron Mountain district and the Wyoming and State Line district, which is located on the Colorado-Wyoming border) and the largest lamproite field in North America (Leucite Hills).

Limited exploration for diamond was reported in the Iron Mountain, State Line, Middle Sybille Creek, and Happy Jack-Eagle Rock districts. A few kimberlites were reportedly discovered in the Happy Jack-Eagle Rock district west of Cheyenne, although these discoveries remained unverified by the WSGS. Exploration was initiated in this district to follow up on the large number of kimberlitic indicator mineral anomalies identified by the WSGS.

Results of mapping and sampling in the Iron Mountain district by the WSGS expanded the known extent of kimberlite (Hausel and others, 2003). Geochemical data for these kimberlites showed similar diamond potential to diamondiferous kimberlites in the State Line district to the south. Based on mapping, there is a high probability for the occurrence of additional kimberlites to the north and west and high probability for the occurrence of buried kimberlites within the district. Most of the sites remained unexplored and none had been drilled.

North of the Indian Guide anomalies, hundreds of kimberlitic indicator mineral anomalies were detected by the WSGS that extend northward into the Elmers Rock greenstone belt. Owing to budget restrictions, only a very small sample of pyrope garnets was tested and a large percentage had G10 geochemistry. Some extraordinary anomalies were also detected in this region, including the Grant Creek anomaly east of the Radichal kimberlite in Middle Sybille Creek drainage north of the Iron Mountain district. This anomaly

---

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending upon the mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 2003 USGS mineral production data published in this chapter are preliminary estimates as of July 2004 and are expected to change. For some mineral commodities, such as construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Specialist contact information may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals/contacts/comdir.html; alternatively, specialists' names and telephone numbers may be obtained by calling USGS information at (703) 648-4000 or by calling the USGS Earth Science Information Center at 1-888-ASK-USGS (275-8747). All Mineral Industry Surveys—mineral commodity, State, and country—also may be retrieved over the Internet at URL http://minerals.usgs.gov/minerals.

[2]Values, percentage calculations, and rankings for 2002 may differ from the Minerals Yearbook, Area Reports: Domestic 2002, Volume II, owing to the revision of preliminary 2002 to final 2002 data. Data for 2003 are preliminary and are expected to change; related rankings also may change.

[3]Ray E. Harris, Staff Geologist—Industrial Minerals and Uranium, and W. Daniel Hausel, Senior Economic Geologist—Metals and Precious Stones, both of the Wyoming State Geological Survey, coauthored the text of the State mineral industry information provided by that agency.

consisted of a group of five stream-sediment samples collected within a one-mile radius of one another that yielded a few hundred indicator mineral grains. Adjacent to the anomaly, an enigmatic outcrop of carbonate within the Precambrian complex remained unexplored. North of the Grant Creek anomaly, similar concentrations of kimberlitic indicator minerals (along with some sapphires and rubies) were identified in several stream sediment concentrates. Another significant indicator mineral anomaly was reportedly found east of Laramie Peak and several miles north of Grant Creek (Lee Peterson, oral commun., 2002).

To the south of Iron Mountain, approximately 40 diamondiferous kimberlites occur along the Colorado-Wyoming border. All kimberlites tested in the State Line district have yielded diamond, and approximately 50% have been of gem quality. One kimberlite on the border produced gemstones that weighed up to 28.3 carats, and included one diamond fragment from an estimated 90-carat diamond (Howard Coopersmith, oral commun., 2003). Another kimberlite in the district yielded a bulk sample with diamond ore grade as high as 135 carats per 100 metric tons. Even with these favorable results, some kimberlites remained untested, and a group of airborne geophysical anomalies, which were interpreted as buried diamond pipes, had yet to be drilled.

Hundreds of other anomalies have been identified in the Wyoming craton. These included a kimberlitic indicator mineral anomaly that was detected in a gravel pit near Baggs, WY, in the Sierra Madre Mountains. The remainder of the mountain range was unexplored for diamond. Several anomalies were reported in the Medicine Bow Mountains in southeastern Wyoming, including a group of kimberlitic indicator mineral anomalies near the town of Centennial, WY. On a recent field trip sponsored by the WSGS that was designed to teach the general public how to pan for gold, some attendees panned pyrope garnet from the Middle Fork of the Little Laramie River. Further to the west, gold prospectors recovered pyrope garnet in Douglas Creek. North of Douglas Creek, a prospector recovered diamond on Cortez Creek. Nearby, one company reported that it had found a kimberlitic indicator mineral anomaly on Iron Creek as well as a diamond from a Proterozoic metaconglomerate during a search for gold.

In eastern Wyoming, a kimberlitic indicator mineral anomaly was reported in the Hartville uplift north of Torrington. In the early 1990s, the WSGS also conducted investigations in the Bighorn Basin in northern Wyoming and identified an extensive kimberlitic indicator mineral anomaly in the southern portion of the basin. To the east, one company reported indicator minerals in the Bighorn Mountains and also to the south in the Owl Creek Mountains.

An extensive kimberlitic indicator mineral anomaly covers a few hundred square miles in the Greater Green River Basin of southwestern Wyoming. One Tertiary diamondiferous lamprophyre was found in this region, but the source of this extensive anomaly remained unexplained. Leucite Hills, which is the largest lamproite field in North America, is located immediately northeast of this region. The WSGS also identified gem-quality peridot in one lamproite.

Unverified occurrences of diamond were reported in the Granite, Wind River, Sierra Madre, Laramie, and Gros Ventre Mountains. Some of the verified placer and paleoplacer diamond included gem-quality diamond found by a gold prospector in Cortez Creek in the Medicine Bow Mountains in 1977. Follow up work in this region by the Superior Minerals Co. in the early 1980s led to the discovery of a kimberlitic indicator mineral anomaly a few miles south in the Iron Creek area, but the source of the Boden diamond had not been identified. Diamond was also accidentally discovered in a core sample of Proterozoic metaconglomerate during a search for Witwatersrand-type gold mineralization. To the east, a 6.2-carat diamond was recovered in Fish Creek in the State Line district south of Laramie (Howard Coopersmith, oral commun., 2003). Other diamond had been found in drainages in the district. Other reports of diamond included a gem-quality diamond that weighed approximately 10 carats, which was found in the Gros Ventre Mountains and a nearly 1.3-centimeter diameter diamond that was found in the Wind River Mountains (J.D. Love, oral commun., 1981).

During the past few years, some colored gemstone occurrences were identified. These included chromian diopside, chromian enstatite, common opal, iolite, kyanite, olivine (peridot), pyrope, ruby, and sapphire. Some of the iolite found in Wyoming is comparable to the best iolite found in the world.

In 1995, the WSGS discovered a source of gem-quality iolite, kyanite, ruby, and sapphire west of Wheatland in eastern Wyoming (Hausel, 2002). Samples collected by the WSGS included three raw iolites that weighed more than 1000 carats and specimens of schist that contained more than 20% pink, red, and white corundum. Some corundum was cut to produce faceted and cabochon pink sapphires and rubies—these included a reddish pink sapphire (2.5 carats) and a ruby (3.5 carats) that were sold to a private collector (Vic Norris, oral commun., 2002). Trenching of the cordierite-gneiss led to the discovery of a rich vein of iolite. It was estimated that more than 10,000 carats of iolite were exposed in about one cubic meter of material.

An important iolite deposit in Wyoming was considered to be possible based on favorable geology reports (Sinkankas, 1959, p. 475). For example, as early as 1959, John Sinkankas proposed that "Iolite is a widespread constituent of schistose and gneissic rocks in the Laramie Range of Albany County. One estimate has placed the quantity available at thousands of tons. Specimens from this locality examined by the author are glassy broken fragments of rather light blue color, verging toward grayish; small sections are clear and suitable for faceted gems. It is entirely possible that important amounts of gem quality material will be produced from this area in the future."

Other Industrial Minerals.—Other industrial minerals being explored in Wyoming included hydrofrac sand and silica sand. There was a small amount of interest in evaporate minerals such as magnesium sulfate and sodium sulfate. Feldspar may be of renewed interest for ceramic products.

Metals

Copper.—Wyoming is host to several base and ferrous metal deposits. One base metal deposit was an important source for copper in the past. The Ferris-Haggarty Mine operated in the early 1900s and shut down only after the mill and smelter burned to the ground

twice, in 1907 and 1908, followed by a 35% decline in copper prices. The mine workings were recently accessed by the WSGS and copper ore was found.

Gold and Silver.—In 2003, the Copper King gold-copper porphyry deposit in the Silver Crown district was leased from the State of Wyoming by a private company. The property is located in the Laramie Range between Cheyenne and Laramie. Available reports describe an in situ resource of 24,000 kilograms (kg) of low-grade gold mineralization with potential for expansion. A recent report indicates that the property contains a gold-equivalent resource of approximately 31,000 kg (Norm Burmeister, oral commun., 2003).

Although much of the district remains unexplored, the Rattlesnake Hills greenstone belt, which is located west of Casper in central Wyoming, continued to attract interest for gold. Significant gold anomalies were detected by the WSGS and mapping identified dozens of additional anomalies. One such anamoly discovered by Canyon Resources (Goat Mountain) is a disseminated gold deposit that, reportedly, potentially contains more than 31,000 kg of gold based on sparse drilling. In addition to Goat Mountain, dozens of prospects and targets remained to be tested in this region. Known anomalies are associated with alkalic intrusives, breccias, exhalites, veins, and stockworks.

Historically, Wyoming's greatest gold producer was the Carissa Mine at South Pass City within the South Pass greenstone belt (Archean). Based on assay maps, mine maps, and drilling and surface sampling, this deposit was thought to contain significant high-grade gold mineralization in a narrow 0.46-meter (m) to 15-m-wide shear zone enclosed by a broad zone (potentially up to 300 m wide) of low-grade gold mineralization. Past exploration on this property outlined a considerable gold resource. Recent legislation set aside State funds to purchase this property to incorporate it into the South Pass City historic site.

A belt of prospects and historic mines between the Carissa Mine and Miners Delight Mine in the greenstone belt lie within a structurally favorable zone. The South Pass greenstone belt also encloses productive placers, some paleoplacers, and is also surrounded by giant paleoplacers. One of these, the Dickie Springs-Oregon Gulch paleoplacer to the south, was estimated by the USGS to host more than 886,000 kg of gold. Some work was reported in the paleoplacer in 2003. The Twin Creek-Red Canyon paleoplacers to the north were also a large deposit. Some exploration was reported in the Dickie Springs paleoplacer during 2003.

The Bear Lodge Mountains alkalic complex contains several rare-earth metal and gold anomalies; exploration, however, was minimal. Past exploration at Smith Ridge identified a drilled gold resource of 5,230 kg. The Treadwell open cut at Mineral Hill to the southeast also yielded significant gold and silver anomalies. In addition to gold, a major silver anomaly was reportedly identified by a mining company.

Other areas of interest included Miracle Mile. An extensive paleoplacer along the northern flank of the Seminoe Mountains in central Wyoming near the Miracle Mile yielded visible gold and diamond-stability pyrope garnet in a few concentrates from panned material collected by the WSGS.

The WSGS collected several samples of quartz with visible gold on Bradley Peak in the Seminoe Mountains greenstone belt in 1981. The quartz was from small veins lying within a large envelope of altered metavolcanics. One sample of altered metavolcanic rock contained anomalous gold.

Several gold anomalies were detected along highway I-80 by the WSGS in the early 1990s. The source of the gold was not identified. One was associated with an historical hydraulic gold mine that is located within 90 m of I-80. Also, significant gold anomalies were identified in the Mineral Hill area and the Bear Lodge Mountains. A treasure hunter found 299 gold nuggets in the Sierra Madre several years ago, but the source of the gold was not identified, and there has been no effort made to find the source.

Platinum-Group Metals (PGM).—Exploration for PGM continued throughout 2003. Several PGM anomalies were identified in the Medicine Bow and Sierra Madre Mountains. A group of mafic and ultramafic intrusives, some of which were potential hosts for PGM, are located parallel to a major suture zone known as the Cheyenne Belt. These include the Lake Owen and Mullen Creek layered complexes; the Centennial Ridge amphibolites in the Medicine Bow Mountains; the Puzzler Hill metapyroxenite, Elkhorn metagabbro, and Woods Mountain peridotite in the Sierra Madre; and the Laramie anorthosite batholith in the Laramie Range (Paul Graff, oral commun., 1997).

URSA Major Minerals Inc. owned a PGM exploration property that totaled approximately 30 claims (240 hectares) in Carbon and Albany Counties, WY (URSA Major Minerals Inc., 2004§[4]). URSA's exploration program for PGM in southern Wyoming focused on a major geological fault structure. URSA's exploration targets in southern Wyoming included high-grade shear-zone-related mineralization on the West Rambler property and reef-type mineralization in the Mullen Creek Complex. The company drilled three holes that totaled approximately 500 m on the West Rambler property. The drill holes tested several geophysical and geochemical targets but did not encounter significant mineralization. The company planned to evaluate further exploration options for potential high-grade copper-PGM mineralization on the property (URSA Major Minerals Inc., 2004§).

Commodity Review

Industrial Minerals

In 2003, overall industrial mineral production in Wyoming was steady; chemical-grade limestone, construction aggregate, gypsum, and siliceous shale production decreased slightly, and bentonite, decorative aggregate, leonardite, and trona production increased. Financing problems plagued the decorative stone industry; Raven Quarries, which was Wyoming's only dimension stone producer,

[4]A reference that includes a section mark (§) is found in the Internet Reference Cited section.

closed in December 2002 and was abandoned and offered for sale by the owner in February 2003. However, a dimension stone quarry in sandstone opened in Wyoming in late 2003.

Bentonite.—Bentonite production increased from 3.2 million metric tons (Mt) in 2002 to 3.4 Mt in 2003. Some of this production increase may have been owing to increases in stockpiles. There were 13 bentonite mills in Wyoming at the end of 2003, which was the same number as at the end of 2002. Each mill was supplied with raw bentonite from several pits.

Cement.—According to the WSGS, Mountain Cement Co., which was located at Laramie, produced more than 450,000 metric tons per year of cement. Production remained essentially constant in 2003 compared with 2002. Cement was manufactured from limestone, gypsum, siliceous shale, and other additives. The major raw materials were quarried near the plant south of Laramie. Gypsum and shale were quarried intermittently and were stockpiled at the plant site.

Clays.—From time to time, small amounts of common clay are mined from a pit north of Evanston in Uinta County. This clay is shipped to the Wasatch Valley in Utah for brick manufacture, and is stockpiled at the brick plant for use when mining in Wyoming is inactive. This quarry was inactive in 2003.

Crushed Stone and Sand and Gravel.—More than 13.6 Mt of crushed stone and sand and gravel were quarried in Wyoming in 2003, which was a decrease of about 12% from that of 2002. This decrease may have been owing in part to large stockpiles that were created by the quarries in 2002 and used in 2003. Production included sand and gravel (river rock), crushed limestone, crushed granite (actually, a gneissic rock), and crushed clinker (baked and fused shale).

Chemical grade limestone production in Wyoming declined from 850,000 t in 2002 to 669,000 t in 2003. Part of this decline was owing to the use of limestone stockpiled in 2002. The decrease was not significant, and 2004 production was expected to remain unchanged from the previous 2 years.

Several small fieldstone quarries continued in operation or opened in Wyoming in 2002. These supplied rock for landscaping, interior and exterior finishing, and similar uses. One of the largest of these quarries was the Cumberland Gap Hearthstone Quarry, which is located south of Kemmerer in western Wyoming. The greatest increase in production was in moss rock. Most of this material was shipped to the Colorado Front Range and ski towns or the Wasatch front of Utah; Wyoming fieldstone, however, was also marketed in California and Illinois.

Decorative crushed rock was produced in several localities in Wyoming in 2003. As with fieldstone, most of Wyoming's production was shipped to Colorado. Imerys Marble Inc. decreased production of the white marble aggregate from its Wheatland quarry and processing plant. About 54,000 t of white marble was quarried in 2002.

Dimension Stone.—The production of polished slabs of Mirage® and Raven® ceased at the end of 2002, and none of was produced in 2003. However, Strid Marble and Granite Co. opened the sandstone quarry southeast of Rawlins and began quarrying the gray sandstone used on the Wyoming State Capitol Building in Cheyenne for sale to local and regional markets. This stone was marketed as Wyoming Gray Sandstone®. Two companies explored in Wyoming for dimension stone in 2003.

Gypsum.—Gypsum was mined at two localities in the Bighorn Basin where it was used as the primary ingredient in wallboard, and south of Laramie, where it was used as a retardant in cement. According to the WSGS, gypsum production in Wyoming declined slightly from 393,000 t in 2002 to 383,000 t in 2003, owing to the use of stockpiled gypsum by Mountain Cement Co., which reported no gypsum mined in 2003.

Silica.—Two related commodities, hydrofrac sand and silica sand, were of interest to companies for possible new production in Wyoming. Owens-Illinois, Inc. planned to construct a new container-glass plant in Windsor, CO, which is located east of Fort Collins, CO, and south of Cheyenne, WY. A source of silica sand for this plant had not been announced. Companies looked in Wyoming for a nearby source of silica sand. Two localities, Cassa and Plumbago Creek, were studied by the WSGS as possible sources of silica sand. These deposits were examined by potential suppliers in 2003.

Hydrofrac sand, which is silica sand that is made up of rounded grains of certain size-specifications that is used in enhanced oil recovery techniques, was the subject of numerous inquiries towards the latter part of 2003. The demand for this product in oil production was increasing. Hydrofrac sand occurrences were reported in Cambrian sandstones in Wyoming, and were the subject of research and exploration.

Soda Ash and Other Sodium Compounds.—The production of soda ash and other sodium-based products in Wyoming were estimated to have increased slightly in 2003 compared with the preceding year, although reported in situ (mine water recovery) production figures were not yet available. The potential growth of Wyoming's trona mining and soda ash refining industry was on hold awaiting developments from China, which was expected to increase its production of synthetic soda ash. Trona was Wyoming's most valuable industrial mineral, and was fourth overall in mineral value to the State following oil, gas, and coal.

Other Minerals.—Black Hills Lignite LLC produced leonardite from one mine near Glenrock, in Converse County. Leonardite was used in agricultural conditioners, wood stains, and other products. Leonardite production from Wyoming had decreased slightly during the past 2 years, but increased to more than 274,000 t in 2003.

References Cited

Hausel, W.D., 2002, A new source of gem-quality cordierite and corundum in the Laramie Range of Southeastern Wyoming: Rocks & Minerals, v. 76, no. 5, p. 334-339.

Hausel, W.D., Gregory, R.W., Motten, R.H., and Sutherland, W.M., 2003, Geology of the Iron Mountain Kimberlite district and nearby kimberlitic indicator mineral anomalies in southeastern Wyoming: Wyoming State Geological Survey Report of Investigations 54, 42 p.

Sinkankas, John, 1959, Gemstones of North America: New York, NY, Van Nostrand Reinhold Company, 675 p.

Internet Reference Cited

URSA Major Minerals Inc., 2004, Wyoming property on the Web, accessed November 22, 2004, at URL http://www.ursamajorminerals.com.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN WYOMING[1, 2]

(Thousand metric tons and thousand dollars)

Mineral	2001		2002		2003[p]	
	Quantity	Value	Quantity	Value	Quantity	Value
Clays:						
Bentonite	3,580	153,000	3,340	145,000	3,340	145,000
Common	11 [e]	47 [e]	33	446	33	446
Gemstones	NA	12	NA	12	NA	12
Sand and gravel, construction	7,200	35,100	7,710	32,100	7,500	31,500
Stone, crushed	4,370	20,400	4,890	23,300	4,000	19,000
Combined values of cement (portland), gypsum (crude), helium (Grade-A), lime, soda ash	XX	806,000	XX	806,000	XX	812,000
Total	XX	1,010,000	XX	1,010,000	XX	1,010,000

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to no more than three significant digits; may not add to totals shown.

TABLE 2
WYOMING: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	2001 Number of quarries	2001 Quantity (thousand metric tons)	2001 Value (thousands)	2001 Unit value	2002 Number of quarries	2002 Quantity (thousand metric tons)	2002 Value (thousands)	2002 Unit value
Limestone[2]	9 r	1,180 r	$4,510 r	$3.82 r	12	1,400	$5,510	$3.92
Granite	2	W	W	4.70	1	W	W	4.71
Marble	1	W	W	4.13	1	W	W	4.13
Quartzite	1	W	W	6.61	1	W	W	6.52
Volcanic cinder and scoria	1	W	W	3.87	1	W	W	3.87
Miscellaneous stone	3	219	906	4.14	2	92	481	5.24
Total or average	XX	4,370	20,400	4.68	XX	4,890	23,300	4.77

[r]Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not available.
[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.
[2]Includes limestone-dolomite reported with no distinction between the two.

TABLE 3

WYOMING: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Construction:			
Coarse aggregate (+1 1/2 inch), riprap and jetty stone	W	W	$9.29
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	6.43
Bituminous surface-treatment aggregate	W	W	4.99
Railroad ballast	W	W	6.39
Fine aggregate (-3/8 inch), stone sand (bituminous mix or seal)	W	W	8.00
Coarse and fine aggregates, graded road base or subbase	W	W	4.01
Chemical and metallurgical, cement manufacture	W	W	3.73
Special, other fillers or extenders	W	W	7.83
Unspecified:[2]			
Reported	2,540	$12,000	4.73
Estimated	1,100	5,600	4.90
Total or average	3,680	17,600	4.78
Grand total or average	4,890	23,300	4.77

W Withheld to avoid disclosing company proprietary data; included in "Grand total." .

[1]Data are rounded to no more than three significant digits, except unit value; may not add to totals shown.

[2]Reported and estimated production without a breakdown by end use.

TABLE 4

WYOMING: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 2002, BY USE AND DISTRICT[1,2]

(Thousand metric tons and thousand dollars)

Use	Districts 1 and 2		Unspecified districts	
	Quantity	Value	Quantity	Value
Construction:				
Coarse aggregate (+1 1/2 inch)[3]	W	W	--	--
Coarse aggregate, graded[4]	W	W	--	--
Fine aggregate (-3/8 inch)[5]	W	W	--	--
Coarse and fine aggregate[6]	W	W	--	--
Chemical and metallurgical[7]	W	W	--	--
Special[8]	W	W	--	--
Unspecified:[9]				
Reported	2,440	11,500	92	481
Estimated	770	4,000	380	1,600
Total	4,420	21,300	467	2,080

W Withheld to avoid disclosing company proprietary data; included in "Total." -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]District 1 and 2 are combined to avoid disclosing company proprietary data.

[3]Includes riprap and jetty stone.

[4]Includes bituminous surface-treatment aggregate, concrete aggregate (coarse), and railroad ballast.

[5]Includes stone sand (bituminous mix or seal).

[6]Includes graded road base or subbase.

[7]Includes cement manufacture.

[8]Includes other fillers or extenders.

[9]Reported and estimated production without a breakdown by end use.

TABLE 5
WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2002,
BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Concrete aggregate and concrete products[2]	744	$5,690	$7.65
Asphaltic concrete aggregates and other bituminous mixtures	512	3,290	6.42
Road base and coverings[3]	1,300	6,060	4.66
Fill[4]	273	850	3.11
Other miscellaneous uses	2	6	3.00
Unspecified:[5]			
Reported	1,050	1,860	1.77
Estimated	3,800	14,000	3.74
Total or average	7,710	32,100	4.16

[1]Data are rounded to no more than three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement and lime).
[4]Includes railroad ballast and snow and ice control.
[5]Reported and estimated production without a breakdown by end use.

TABLE 6
WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 2002,
BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		Unspecified districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	318	3,310	426	2,390	--	--
Asphaltic concrete aggregates and road base materials[3]	839	5,150	951	4,110	22	89
Fill[4]	126	526	147	324	--	--
Other miscellaneous uses	--	--	2	6	--	--
Unspecified:[5]						
Reported	43	196	2	4	1,000	1,660
Estimated	1,200	5,300	2,700	9,000	--	--
Total or average	2,500	14,500	4,180	15,800	1,020	1,750

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes plaster and gunite sands.

[3]Includes road and other stabilization (cement and lime).

[4]Includes railroad ballast and snow and ice control.

[5]Reported and estimated production without a breakdown by end use.